IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (*Currently Amended*): A method of determining the displacement of an object in an apparatus along ~~the~~ a z-direction, said object being illuminated by a beam of radiation having an optical axis extending along the z-direction, said method comprising:

providing a reference laser beam;

providing a measuring laser beam that is directed substantially perpendicularly incident on a measuring mirror with a fixed position relative to said object such that a ~~normal~~ reference line normal to the measuring mirror makes a non-zero acute angle with said z-direction, said measuring laser beam being substantially retro-reflected and at least partly overlapping said reference beam to provide an interference signal;

determining a change in said interference signal; and

processing said change in order to determine the displacement of said object along the z-direction.

2. (*Currently Amended*): A method of determining the displacement of an object in an apparatus along the z-direction, said object having a surface which extends substantially in a plane perpendicular to said z-direction and which is illuminated by a beam of radiation having an optical axis extending along the z-direction, said method comprising:

providing an interferometer system comprising:

a laser beam generator system configured to generate at least one reference laser beam and at least one measuring laser beam;

at least one mirror, wherein said at least one mirror includes a measuring mirror with a fixed position relative to said object and having a mirror surface~~, the~~ in which a reference line normal to the mirror surface ~~which~~ makes a non-zero acute angle with said z-direction;

an interference signal processing system configured to receive an interference signal produced by said reference laser beam and said measuring laser

beam, and to determine said displacement based on a change in said interference signal;

providing said reference laser beam and said measuring laser beam such that said measuring laser beam is directed towards said measuring mirror in a direction substantially perpendicular to said mirror surface and said measuring laser beam is substantially retro-reflected by said measuring mirror to at least partly overlap said reference beam to generate said interference signal;

determining a change in said interference signal; and

processing said change in order to determine the displacement of said object along the z-direction.

3. (*Original*): The method of Claim 2, wherein said measuring mirror is arranged such that said normal to said measuring mirror contains an angle α with respect to the z-direction, wherein α is between approximately 60° and about 87°.

4. (*Original*): The method of Claim 2, wherein said measuring mirror is arranged such that said normal to said measuring mirror contains an angle α with respect to the z-direction, wherein α is between approximately 75° and 85°.

5. (*Original*): The method of Claim 2, wherein said measuring laser beam is directed such that a distance between a point where said optical axis of the beam of radiation intersects said surface of said object and a line coincident with an optical axis of a part of said measuring laser beam that is incident on said measuring mirror is less than 6 mm.

6. (*Original*): The method of Claim 2, wherein at least one additional displacement is determined and said interference signal processing system uses said additional displacement to determining the displacement of said object in the z-direction.

7. (*Currently Amended*): A method of determining the displacement of an object in an apparatus along the z-direction, said object having a surface which extends substantially in a plane perpendicular to said z-direction and which is illuminated by a beam of radiation having an optical axis extending along the z-direction, said method comprising:

providing an interferometer system, comprising:

a laser beam generator system arranged and constructed for generating at least one reference laser beam and at least one measuring laser beam;

a set of at least two mirrors comprising at least one mirror which is a measuring mirror fixedly connected to said object and having a mirror surface~~, the~~ in which a reference line normal to the mirror surface ~~which~~ makes a non-zero acute angle with said z-direction and at least one separate mirror having a fixed position with respect to said apparatus;

an interference signal processing system, arranged and constructed for receiving an interference signal produced by said reference beam and said measuring beam and for determining a displacement on the basis of a change in said interference signal;

providing a reference laser beam and a measuring laser beam, wherein said measuring laser beam is directed towards said measuring mirror such that said measuring laser beam is reflected by said measuring mirror towards said separate mirror in a direction substantially perpendicular to said separate mirror and at least partly overlaps said reference to provide an interference signal;

determining a change in said interference signal; and

processing said change in said interference signal in order to determine said displacement in the z-direction.

8. (*Currently Amended*): A lithographic apparatus, comprising:

a projection system configured to provide a beam of radiation for illuminating an object, said beam of radiation having an optical axis in a z-direction;

a movable holder configured to hold said object; and

an interferometer system configured to determine a displacement of said object along a z-direction, said interferometer system comprising:

a laser beam generator system configured to generate at least one

reference laser beam and at least one measuring laser beam;

at least one mirror, wherein said at least one mirror includes a measuring mirror with a fixed position relative to said object and having a mirror surface~~, the~~ in which a reference line normal to the mirror surface ~~which~~ makes a non-zero acute angle with said z-direction; and

an interference signal processing system configured to receive an interference pattern based on said reference laser beam and said measuring laser beam and to determine said displacement based on a change in said interference signal,

wherein said normal to said mirror surface is substantially parallel to a direction of incidence of said measuring laser beam on said mirror surface.

9. (*Original*): The lithographic apparatus of Claim 8, further comprising a holder mover system configured to move said holder, wherein said holder mover system is operatively connected to said interferometer system.

10. (*Original*): The lithographic apparatus of Claim 9, wherein said holder mover system is at least controlled by said interferometer system when moving said holder along the z-direction.

11. (*Original*): The lithographic apparatus of Claim 8, wherein said measuring mirror is arranged such that a normal to said measuring mirror contains an angle α with respect to the z-direction, wherein α is between approximately 60° and 87°.

12. (*Original*): The lithographic apparatus of Claim 11, wherein said measuring mirror is arranged such that a normal to said measuring mirror contains an angle α with respect to the z-direction, wherein α is between approximately 75° and 85°.

13. (*Original*): The lithographic apparatus of Claim 8, wherein said measuring laser beam has a direction such that a distance between a point where the optical axis of said beam of radiation intersects said surface of said object and a line coincident with an optical axis of a part of said measuring laser beam that is incident on said measuring mirror is less than 6 mm.

14. (*Original*): The lithographic apparatus of Claim 8, further comprising an additional displacement measuring system configured to determine at least one additional displacement in at least one additional direction, wherein said interference signal processing system has been arranged and constructed to use said additional displacement in determining the displacement of said object in the z-direction.

15. (*Currently Amended*): The lithographic apparatus of Claim 8, wherein said interferometer system is configured to determine at least one additional displacement, wherein said interference signal processing system is constructed and arranged to convert a combination of said ~~optical~~ interference signal and said at least one additional displacement into a value for the z-displacement.

16. (*Original*): The lithographic apparatus of Claim 8, wherein said laser beam generator system is capable of providing at least one additional measuring laser beam and at least one additional reference laser beam for determining at least one additional displacement of said holder.

17. (*Original*): The lithographic apparatus of Claim 16, wherein said measuring laser beam and at least one additional measuring laser beam are substantially parallel and incident on said measuring mirror.

18. (*Original*): The lithographic apparatus of Claim 17, wherein said interferometer system further comprises an additional measuring mirror with a fixed position with respect to said holder and having an additional mirror surface, the additional normal reference to which makes a non-zero acute angle with said z-direction, said at least one additional measuring laser beam being incident on said additional measuring mirror in a direction substantially parallel to said additional normal.

19. (*Original*): The lithographic apparatus of Claim 18, wherein said measuring mirror and said additional measuring mirror are provided on opposite sides of the holder.

20. (*Currently Amended*): A lithographic apparatus, comprising:

a projection system configured to provide a beam of radiation for illuminating an object, said beam of radiation having an optical axis in a z-direction;

a movable holder configured to hold said object; and

an interferometer system configured to determine a displacement of said object along a z-direction, said interferometer system comprising:

a laser beam generator system configured to generate at least one reference laser beam and at least one measuring laser beam;

at least one mirror, wherein said at least one mirror includes a measuring mirror with a fixed position relative to said object and having a mirror surface~~, the~~ in which a reference line normal to the mirror surface ~~which~~ makes a non-zero acute angle with said z-direction; and

an interference signal processing system configured to receive an interference pattern based on said reference laser beam and said measuring laser beam and to determine said displacement based on a change in said interference signal,

wherein said measuring laser beam has a direction of incidence on the measuring mirror outside a plane in which the z-direction and said normal to said mirror surface lie, there being provided a separate mirror constructed and arranged for substantially retro-reflecting said measuring laser beam.

21. (*Currently Amended*) A device manufacturing method, comprising:

providing an object in a movable holder;

illuminating said object with a beam of radiation having an optical axis in the z-direction;

moving said object during at least part of the illuminating; and

determining a displacement of said object along the z-direction by:

providing a reference laser beam;

providing a measuring laser beam that is directed substantially perpendicularly incident on a measuring mirror with a fixed position relative to said object such that a ~~normal~~ reference line normal to the measuring mirror makes a non-zero acute angle with said z-direction, said measuring laser beam being substantially retro-reflected and at least partly overlapping said reference beam to provide an interference signal;

determining a change in said interference signal; and

processing said change in order to determine the displacement of said object along the z-direction.

22. (*Original*): The device manufacturing method of Claim 21, wherein, during at least a part of the illuminating of said object, the optical axis of the beam of radiation is outside said object in said holder.

23. (*Currently Amended*): A device manufacturing method, comprising

providing a projection system configured to provide a beam of radiation for illuminating an object, said beam of radiation having an optical axis in a z-direction;

providing a movable holder configured to hold said object;

providing an interferometer system configured to determine a displacement of said object along a z-direction, said interferometer system comprising:

a laser beam generator system configured to generate at least one reference laser beam and at least one measuring laser beam;

at least one mirror, wherein said at least one mirror includes a measuring mirror with a fixed position relative to said object and having a mirror surface~~, the~~ in which a reference line normal to the mirror surface ~~which~~ makes a non-zero acute angle with said z-direction; and

an interference signal processing system configured to receive an interference pattern based on said reference laser beam and said measuring laser beam and to determine said displacement based on a change in said interference signal, wherein said normal to said mirror surface is substantially parallel to a direction of incidence of said measuring laser beam on said mirror surface;

securing an object in said holder;

illuminating said object with said beam of radiation; and

moving said object during at least part of said illuminating;

wherein the z-displacement of said object is determined based on said interferometer system and said interference signal processing system of said lithographic apparatus.

24. (*Original*): The device manufacturing method of Claim 23, wherein, during at least a part of the illuminating of said object, the optical axis of said beam of radiation is

outside said object in said holder.